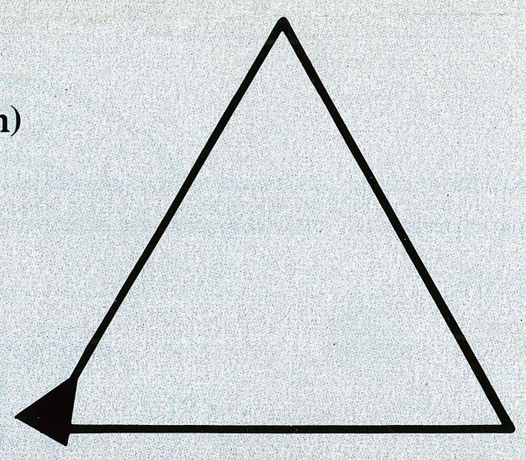
LOGO POLYGONS

A *polygon* (PÄL-i-gän) is a closed shape that has straight sides. A rectangle is a polygon. A five-pointed star is also a polygon. Can you think of other examples of polygons?

The smallest number of sides that a polygon can have is three. (Just try to make a polygon with two sides!) A polygon with three sides is called a *triangle*. One with four sides of equal length is called a *square*. A five-sided polygon is called a *pentagon*. Do you know what a six-sided polygon is called? (HINT: Check diagrams below.)

There are many ways to make triangles, squares, and other polygons using Logo. Below is one way to make a triangle, a square, and a pentagon.

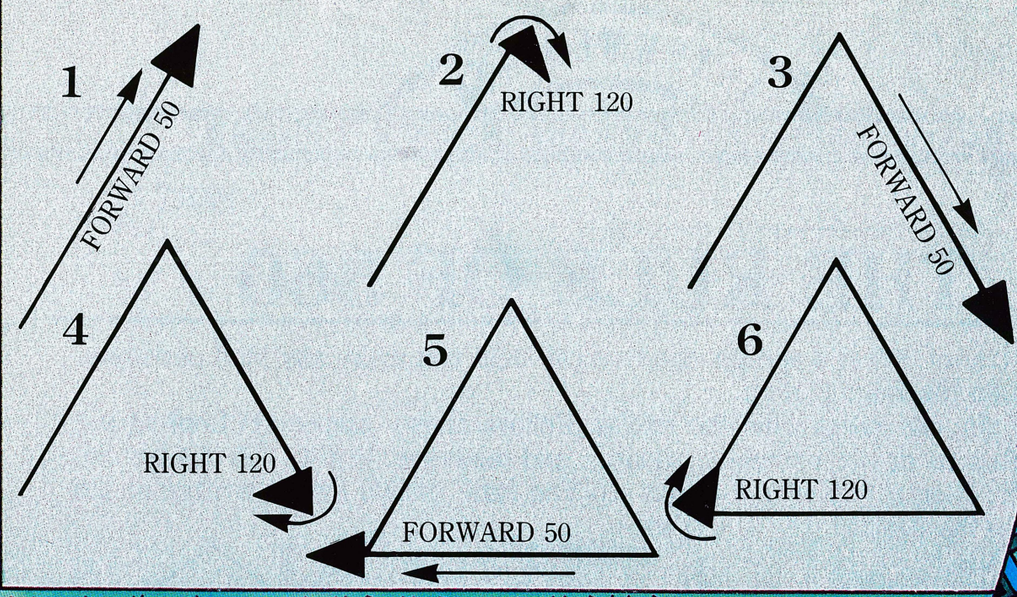
TRIANGLE
(Three-Sided Polygon)



Use this Logo procedure:

```
TO TRIANGLE
  REPEAT 3 [FORWARD 50 RIGHT 120]
END
```

STEPS IN "TO TRIANGLE" Here is what the triangle procedure at left tells the computer to do.



MORE POLYGONS

SQUARE
(Four-Sided Polygon)

```
TO SQUARE
  REPEAT 4 [FORWARD
50 RIGHT 90]
END
```

PENTAGON
(Five-Sided Polygon)

```
TO PENTAGON
  REPEAT 5 [FORWARD
50 RIGHT 72]
END
```

HEXAGON
(Six-Sided Polygon)

Can you complete this procedure?

```
TO HEXAGON
_____________
END
```

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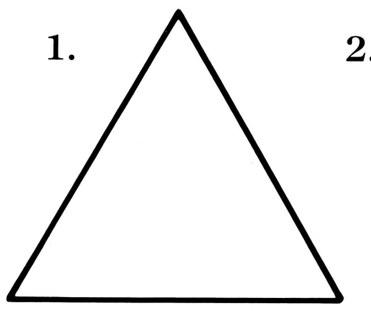
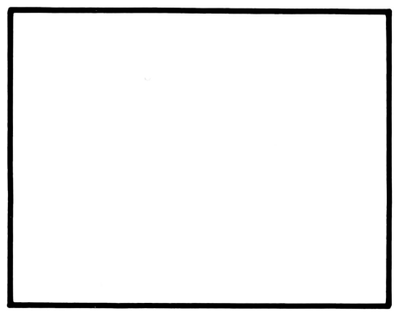
COLOR THE POLYGONS

A *polygon* is a closed shape with straight sides. Color all the polygons below.

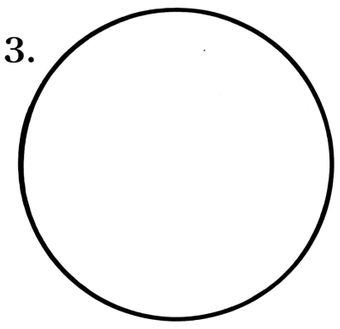
1.



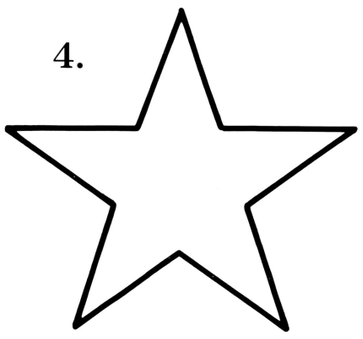
2.



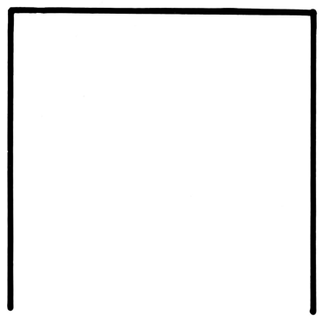
3.



4.



5.



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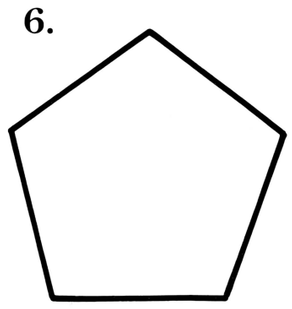
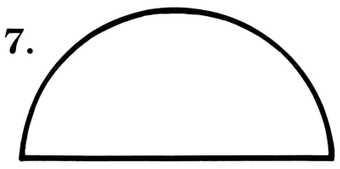
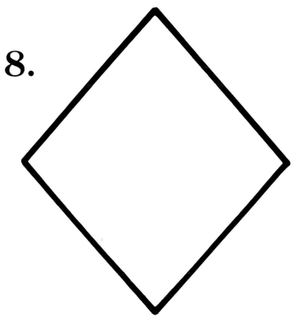


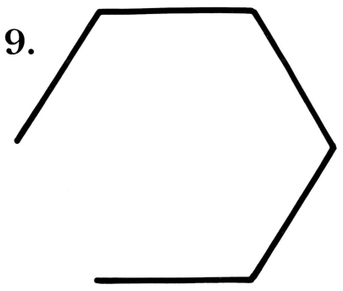
7.



8.



9.



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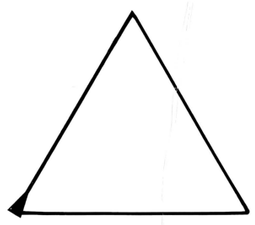
MAKE LOGO POLYGONS

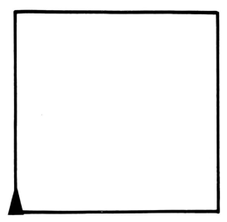
Write the name of each polygon in the blank next to it. After you fill in the blanks, you will have a Logo procedure for each polygon. Boot Logo into your computer. Then type the procedures into your computer to see the polygons.



1. TO _____

REPEAT 3 [FORWARD 50 RIGHT 120]

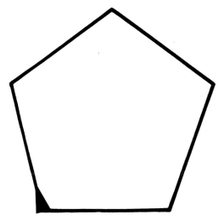
END



2. TO _____

REPEAT 5 [FORWARD 30 RIGHT 72]

END



3. TO _____

REPEAT 4 [FORWARD 50 RIGHT 90]

END

WORD LIST

PENTAGON
TRIANGLE
SQUARE

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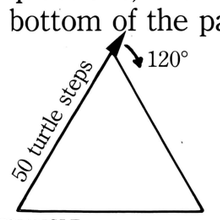
NAME: _____ PART 1

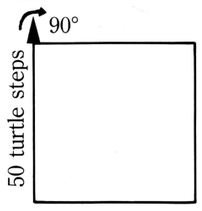
THE RULE OF 360

The Rule of 360 is a special rule that can help you make any kind of regular polygon on the Logo screen.

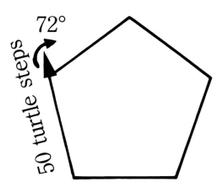
See if you can guess what the rule is. Follow these steps: (1) Look at the procedures to draw a triangle, square, and pentagon below; (2) answer the questions; then (3) fill in the blanks to The Rule of 360 that is written at the bottom of the page.



TO TRIANGLE
REPEAT 3 [FORWARD 50 RIGHT 120]
END



TO SQUARE
REPEAT 4 [FORWARD 50 RIGHT 120]
END



TO PENTAGON
REPEAT 5 [FORWARD 50 RIGHT 72]
END

1.(a) In the TRIANGLE procedure, how many times does the turtle repeat the commands in brackets? _____

(b) In the SQUARE procedure, how many times does the turtle repeat the commands? _____

(c) In the PENTAGON procedure, how many times does the turtle repeat the commands? _____

2.(a) In the TRIANGLE procedure, how many degrees to the right does the turtle turn at each corner? _____

(b) What is the *total* number of degrees the turtle turns to make a triangle? (Hint: The turtle makes 3 turns.) _____

(c) What is the *total* number of degrees the turtle turns to make a square? _____

(d) What is the *total* number of degrees the turtle turns to make a pentagon? _____

3. Now see if you can complete The Rule of 360 in the box below.

THE RULE OF 360

To use the Rule of 360, first count the number of sides in the polygon. This number equals the number of times the turtle _____ the commands in brackets.

Next, divide the number of sides into _____, or the total number of degrees the turtle turns to make a polygon. That will give you the number of degrees the turtle turns right at each corner.

The distance the turtle travels forward changes the size of the polygon, but not the _____ of the polygon.

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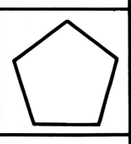
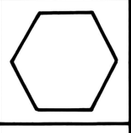
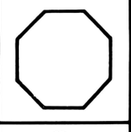
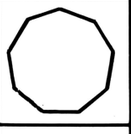
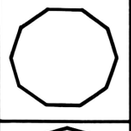
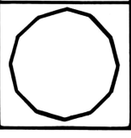
NAME: _____ PART 2

THE RULE OF 360

You can use the rule of 360 to make hexagons, octagons, and other regular polygons. This chart will help you. Fill in the missing blanks.

Name of Polygon	Shape	Number of Sides	Number of REPEATs	Degrees to Turn	Logo Procedure
Pentagon		5	5	360/5 = 72	REPEAT 5 [FD 50 RT 72]
Hexagon					
Octagon					
Nonagon					
Decagon					
Dodecagon					

Challenge: Use the Rule of 360 to make a circle on your Logo screen.

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